Working for Water

For use with: Arizona Wildlife Views Television Show, 07-08 Season, Episode 4

Human-Environment Interactions; Habitat Restoration **Time Frame:** 2-3 hours **Grade:** 4-8

Overview:
This video examines some of the ways that government agencies improve aquatic habitats. Their work focuses on invasive species control, education, and habitat restoration. Students will have the opportunity to plan a school-based restoration project.

Essential Questions
- How do biologists manage wildlife populations?
- How can human activities benefit and harm wildlife?

Objectives
- Describe two ways that the government is working to improve Arizona's aquatic habitats.
- Develop a plan to restore a section of the school to natural habitat.
- Present plan to school principal.

Arizona Department of Education Standards

Science

4th grade	5th grade	6th grade	7th grade	8th grade
S3-C1-PO1 S4-C3-PO4	S3-C1-PO2	S3-C2-PO1 S4-C3-PO2	S3-C1-PO1 S3-C1-PO2 S3-C1-PO3 S3-C2-PO1	S3-C2-PO1

Social Studies

4th grade	5th grade	6th grade	7th grade	8th grade
S4-C1-PO3 S4-C5-PO3	S4-C1-PO6	S4-C1-PO1 S4-C5-PO2	S4-C1-PO1 S4-C5-PO4 S4-C5-PO5	S4-C1-PO1 S4-C5-PO1

Listening and Speaking

4th – 8th grades
LS-E2

Workplace Skills

4th – 8th grades	
1WP-E8	3WP-E2

Materials and Resources
- Copy of Arizona Wildlife Views episode

Teacher Preparation
- Acquire a copy of the television show. You can check local listings to determine when it will air and record it directly. You may also check the Department's web site to see if a copy can be downloaded or ordered.
- Write the vocabulary words and questions on the board.

Background Information:
This is not a lesson plan in the traditional sense. It does not provide step-by-step directions for completing an activity. Instead, it provides information to help you use an episode of the *Arizona Wildlife Views* television program in your classroom. It contains four suggested activities along with extensions and modifications. The first activity focuses on vocabulary. We have provided and defined

some of the words used in the video. You are encouraged to use any appropriate strategies to introduce these to your students. Then, there is a series of comprehension questions that students can answer while watching the video. Answers (directly from the video) are provided in italics. Next, the critical thinking questions build on the major concepts introduced in the video. Students need to put a little bit more thought into these questions. Some reasonable answers are provided in italics. However, teachers should be cautious and realize that students may provide additional answers that can be supported with evidence. Finally, there is an in-depth activity. This activity allows students to evaluate and synthesize one or more of the concepts from the video, perhaps applying it to a new context or utilizing additional skills.

This episode originally aired on PBS (KAET Channel 8) in Phoenix on February 10, 2008. It may also be shown on regional PBS stations or other channels. For additional viewing information or download options, please visit **http://www.azgfd.gov/focuswild**.

Additional information about the topics featured in this episode can be found at:

- ✓ Crayfish Ugh and Yum brochure: http://www.azgfd.gov/pdfs/i_e/Crayfish_Brochure.pdf
- ✓ Crayfish in the Classroom: http://www.azgfd.gov/i_e/ee/lessons/crayfish/classroom.shtml
- ✓ Rio Salado Project: http://phoenix.gov/RIOSALADO/

Relevant Vocabulary:

- o Curtail – to restrict or to end
- o Invasive species – an animal or plant that has moved into an area and caused damage to the ecosystem
- o Native species – an animal or plant that is originally found in a particular area and has not been introduced
- o Omnivorous – eats both plants and animals
- o Riparian – the ecosystem along a river
- o Thermocline – the layer of water where the warm and cold temperatures mix

Comprehension Questions:

1. What is another name for crayfish? *Answer: Crawfish, crawdad, mudbug.*
2. How did crayfish get into Arizona? *Answer: They were introduced as live bait in the 1940s.*
3. What are pisces pyramids? *Answer: Artificial, man-made fish habitats that provide shelter and cover in lakes with little natural habitat.*
4. Why is the 25-foot contour line important for placing the pyramids? *Answer: This is the area of the lake that is 25 feet underwater, right at the thermocline. This is an ideal location for the fish. As you get deeper, the water starts to lose temperature and oxygen quickly.*
5. What lake was created by the construction of Stewart Mountain Dam? *Answer: Saguaro Lake.*
6. What happened to the Salt River in the Phoenix area after the dam was built? *Answer: It dried up and became a dumping ground.*
7. What is the goal of the Rio Salado Habitat Restoration Project? *Answer: To restore some of the native wetlands and riparian habitats that were historically found along the Salt River in Phoenix.*
8. Where does the trash currently found in the Rio Salado come from? *Answer: It washes down storm drains from all over the Phoenix area.*
9. How many species of birds have been seen at Rio Salado since the project opened? *Answer: Over 200 (204 at the time of the filming).*

Critical Thinking Questions:

1. There are two species of crayfish found in Arizona. Their scientific names are *Orconectes virilis* and *Procambarus clarkia.* However, they are both commonly called crayfish. What are the benefits to scientific names? Common names? *Answer: Scientific names are controlled by a set of rules that ensures that every single species on Earth can be identified by one unique name. This*

name is the same in all languages. Typically, these names remain the same throughout time. Because scientific names are usually technical (with Latin and German roots), they can be difficult to remember and pronounce. Common names are any other names to which an animal or plant is referred. They are usually much easier to remember and pronounce. Unfortunately, common names tend to be regionally determined and have a lot of variation. Sometimes, different species may have the same common name. A specific animal will only have one scientific name but it could have many common names.

2. When you wash a car, what happens to the water? Why is it important to monitor the types of chemicals you use? *Answer: Sometimes this water and the chemicals are soaked up by the ground. Often, however, the water flows down the street to the storm drains. These drains usually flow to nearby washes, streams, and rivers. In the Phoenix area, most of these drains lead to the Salt River. Anything in the water, including trash and chemicals, travels to the river, polluting the water and habitat.*

In-Depth Activity: Schoolyard Restoration

The Rio Salado Project is an example of a successful large-scale habitat restoration. However, these types of projects do not always need to take many years and millions of dollars to complete. Even small efforts, at home or school, can make a difference in improving habitat for Arizona's native wildlife.

Take a walk around your school grounds. As you walk, pay careful attention to the habitat. In what ways has the local environment been modified because of your school? How could you try to fix these problems, or at least minimize their impact? Perhaps you could plant native trees and shrubs or remove non-native plants. Perhaps you could provide more garbage cans for students to put their trash. These are just some ideas.

Divide a sheet of paper into two columns. In the first column, list your observations from above. In the second column, next to each item, describe at least one way you would try to address the problem.

Now pretend the school district has given you a small section of the school to restore. What section would it be? What would you do to improve the habitat? Draw a map of your area and write an essay explaining your changes. If possible, present your ideas to the school principal.

Differentiated Instruction:

Extensions:

- **Art:** Draw two pictures of the Salt River through the Phoenix area. The first one should focus on the river after the dams were built. The second one should focus on what the river looks like now that the restoration has begun.
- **Geography:** Research the lakes found on the Salt River. Which ones, if any, are natural? Which ones were created by dams? What are the names of the dams and when were they built? Why were each of the dams created? Locate the lakes and the dams on an Arizona map.
- **Language Arts:** Throughout history, dams have been the subject of much debate. Write an essay which explores the pros and cons for building dams. Pretend a new dam is being proposed for a river or stream near your school. Use your essay to convince the reader that the dam should or should not be built.
- **Mathematics:** The cleanup of the Salt River, in order to restore it to a more natural state, was tremendous. There were 138,572 cubic yards of waste removed from the riverbed. Convert this number to cubic feet? Cubic meters? About 1,185 tons of tires were removed as well as 140,000 pounds of additional waste. Which weighed more, the tires or the other waste?

Modifications:

- Create a student handout with the vocabulary words and questions already provided.
- Provide students with the definitions and have them match them to the appropriate vocabulary words.
- Provide fill-in-the-blank responses for the Comprehension Questions, allowing students to listen for appropriate words to complete the sentences.
- Download the video transcripts and provide to students.

Reflection:

Use the space below to reflect on the success of the lesson. What worked? What didn't? These notes can be used to help the next time you teach the lesson. In addition, the Department would appreciate any feedback. Please visit **http://www.azgfd.gov/focuswild** and submit a lesson evaluation.